

CLAIMS

Sub B17

1. An antenna device (10) having a first antenna (21) adapted for telecommunication in at least a first frequency band and a second antenna (22) adapted for short-range supplementary communication in a second frequency band, characterized in that

the first and second antennas (21, 22) are formed on a common support element (26, 27).

2. An antenna device as in claim 1, where the first and second antennas (21, 22) are formed as printed traces of conductive material on said support element (26, 27).

3. An antenna device as in claim 1 or 2, where said support element comprises a flexible dielectric film.

4. An antenna device as in claim 2 or 3, where the first antenna (21) comprises a first feeding point (41) and the second antenna (22) comprises a second feeding point (39), the first and second feeding points being electrically isolated from each other.

5. An antenna device as in claim 4, where the second antenna (22) comprises a grounding point (40) positioned in proximity with the second feeding point (39).

6. An antenna device as in claim 5, where the second antenna (22) is a planar inverted F-type antenna (PIFA).

7. An antenna device as in any of claims claim 4-6, where the first antenna (21) is a monopole antenna.

8. An antenna device as in claim 6, where the second antenna (22) is adapted for Bluetooth® communication in a 2.4 GHz frequency band.

9. An antenna device as in claim 7, where the first antenna (21) is a multi-band antenna.

5 10. An antenna device as in claim 9, where the first antenna (21) is adapted for communication in a 900 MHz frequency band and at least one of an 1800 MHz frequency band and a 1900 MHz frequency band.

10 *cul* 11. A portable telecommunication apparatus (1), characterized by an antenna device as defined in any of claims 1-10.

15 12. A portable telecommunication apparatus as in claim 11, further comprising a printed circuit board (33) with radio circuitry (23, 24) mounted thereon, and an antenna connector (28) adapted to provide electric contact between the first and second antennas (21, 22) and said radio circuitry (23, 24).

20 13. A portable telecommunication apparatus as in claim 12, the antenna device being defined by claim 5, wherein the antenna connector (28) has:

25 a first resilient contact pin (31) adapted to engage with the first feeding point (41) of the first antenna (21).

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Ay a second resilient contact pin (29) adapted to engage with the second feeding point (39) of the second antenna (22), and

30 a third resilient contact pin (30) adapted to engage with the grounding point (40) of the second antenna (22).

14. A portable telecommunication apparatus as in claim 13, wherein the first, second and third resilient contact pins (31, 29, 30) are pogo pins.

15. A portable telecommunication apparatus as in claim 13, wherein the first, second and third resilient contact pins (31, 29, 30) are spring ledges.

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16. A portable telecommunication apparatus as in any of claims 11-15, where the antenna device (10) is contained in a plastic or rubber antenna housing (42), which is attached to an upper rear portion of the portable tele-

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17. A portable telecommunication apparatus as in any of claims 11-16, where the apparatus is a radio telephone (1), preferably a mobile telephone.

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19. A portable telecommunication apparatus as in claim 17, where the apparatus is adapted for use in a GSM, UMTS or D-AMPS mobile telecommunications network.

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